

REMARKS

Claims 1-29 were previously cancelled. Claims 30-51 have been rejected. Claims 52-63 have been added so that Claims 30-63 are now pending.

Reconsideration and withdrawal of the rejections set forth in the Office.

A Petition for a 3-month extension of time and payment or authorization for payment accompanies this amendment to extend the due date for response to 11 July 2007.

I. Oath/Declaration

The Examiner stated the Declaration as being defective. Applicant's hereby submit a new Declaration in compliance with 37 CFR 1.52(c).

II. Specification

The Examiner has requested that the details of the Microfiche Appendix be provided. Applicant has requested deletion of lines 15-18 at page 1, as applicant's records indicate that no microfiche appendix was submitted in this application.

The Examiner has rejected the Abstract as filed with the specification as not being clear and concise. Applicant has hereby provided a new replacement Abstract.

Applicant trusts that with these amendments the objection to the specification and abstract will be withdrawn.

III. Rejections under 35 U.S.C. §103

The Examiner has rejected claims 30-51 under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,438,573 to Nilsen in view of U.S. Patent No. 5,954,792 to Balarin.

With reference to claim 30, the examiner suggests that Nilsen teaches the invention substantially as claimed and identifies certain portions of the Nilsen reference in attempted support for this suggestion. Before addressing differences in features or elements between the claimed invention and Nilsen and Balarin, Applicant addresses some fundamental differences that transcend feature specific differences and differentiate the invention as a whole.

With respect to Nilsen, this reference and the technique described is really concerned with preempting tasks based on deadlines (or times to execute). Atomic segments are treated only to the extent of determining whether they will finish within the deadline. If they do not finish within the deadline, then the Nilsen scheduler will not enter them. The Nilsen approach is somewhat of a macro level time-slicing scheduler like that described in Stallings. Applicant submits that the Nilsen approach will not operate if all of the tasks in Nilsen are made non-preemptible. In Nilsen, using the Nilsen calculation, a task that exceeds the allotted time will never be scheduled.

By comparison, the same task will be scheduled using the required earliest action start time criterion.

Furthermore, Applicant submits that Balarin considers tasks whose execution time is known, and dependencies between tasks is known. Balarin then computes from this graph of dependencies whether a given schedule sequence terminates within a duration corresponding to some internal or external requirement. The Balarin schedule itself is statically fixed given a certain arrival of external events.

By comparison, the inventive system and method generates or synthesizes a schedule for internal tasks and their dependents based on earliest start time criterion which is computed dynamically at the end of each task or action.

Applicant therefore submits that the suggested combination of Nilsen and Balarin do not teach, suggest, or motivate any need for the features required in applicants now pending claims.

Returning now to the Examiner's feature specific comparison, with respect to the feature of "each action having a scheduled start time", Applicant respectfully submits that the method described in Nilsen uses a mixture of time-slice allocated preemptible and non-preemptible tasks. Nilsen will not work if it were to use only non-preemptible tasks and it must use both preemptible and non-preemptible tasks. Claim 30 of the instant application requires that all the plurality of actions be non-preemptible, or in other words that none of the actions be preemptible. (Dependent claims 52-54 describe a further embodiment in which "all of the components to be performed by the computing device are performed non-preemptively using non-preemptible actions implemented as function calls without context switching." Dependent

claims 60-64 further require that "each of the plurality of components "consists of" a plurality of actions rather than include or comprise a plurality of actions.)

With reference to the "determining an earliest start time", Applicant further submits that although Nilsen may disclose a time, the Nilsen time is of duration maximums, and the Nilsen earliest deadline refers to the end time of the smallest duration of nested time-limited statements (See Nilsen at col. 10, lines 13-26). This end time is not a "start time" as recited and required by applicants Claim 30.

With reference to the "identifying an earliest component" element, Applicant further submits that the suggested teaching of "identifying an earliest component" is different from that required by Applicant's claim 30. Nilsen describes an internal queuing method so that requests are granted in order, irrespective of current status "may have temporarily withdrawn request". Again, Applicant submits that this internal queuing where requests are granted in order irrespective of current status is different than the method recited in claim 30 in which the invention identifies the action with the earliest start time.

With reference to the examiner's suggestion that Nilsen teaches the step of "executing a first action", Applicant again respectfully disagrees. Nilsen may suggest methods (or steps within a method) for changing priorities, but fails to disclose, suggest, or motivate any need to execute the action with the earliest start time as required by Claim 30. Applicant acknowledges that the Examiner concedes that Nilsen does not specifically teach obtaining a returned event from the executed action and propagating the returned event to a second action from dependent components of the earliest component.

Applicant also notes that the method described in Balarin would not properly be combined with Nilsen to provide the invention, at least in part because it uses a method involving changing priorities and does not overcome the attended problems associated with these changed priorities as described in the background section of the instant application.

Applicant has amended claim 30 to make clear these differences. Claims dependent from claim 30 have also been amended for consistency with the underlying independent claim. The examiner has rejected computer program product claim 38 on substantially the same basis as independent method claim 30. Applicant submits that claim 38 is distinguished over the cited art for at least the same reasons argued relative to independent method claim 30, and

does not repeat those arguments here. System claim 46 though reciting different elements and being of different scope than Claims 30 and 38, is also distinguishable from the cited art for at least the same reasons argued relative to method claim 30, and again Applicant does not repeat those arguments here.

Applicant therefore submits that the suggested combination of references would not have made the claimed invention obvious to a person of ordinary skill in the art at the time the invention was made, and that each of the independent claims are patentably distinguished over the cited prior art.

Each of the dependent claims are patentable over the cited art for at least the same reasons as the underlying base claims and further because each adds additional limitations.

With reference to claim 31, applicant has already distinguished certain of the features in the underlying base claim particularly those differences relative to the start time. Applicant further notes that claim 31 has been amended to recite with greater particularity that the "unique identifier used to select the earliest component from said plurality of components". Applicant submits that to the extent that Nilsen may describe identifiers, any such Nilsen identifiers used for completely different purposes to those used in our invention and now recited in claim 31.

With reference to claim 32, Applicant has amended this claim to further clarify that "the first action is selected from those actions that have a same earliest start time based on a predefined preference associated with the first action." Applicant submits that the referenced Nilsen text refers to known prioritizations and not in relation to the claimed earliest start time based method.

With reference to claim 33, Applicant has amended this claim to further clarify that "dividing at least one of said components into said plurality of non-preemptible actions, wherein each of said plurality of actions are scheduled for non-preemptive execution and are non preemptively executed.

With reference to claims 34-36, Applicant reiterates that Nilsen fails to disclose, suggest, or motivate any need for using the earliest start time determination. These claims also recite steps involved with an interrupt is received which are not disclosed, suggested, or motivated in or by the cited prior art.

With reference to claim 37, Applicant submits that even if Nilsen and/or Balarin may suggest using and updating states, the claim is differentiated from the cited art based on the underlying non-preemptive earliest start time methodology.

Applicant has already addressed independent computer program product claim 38 and independent system claim 46. With reference to rejected dependent claims 39-45, and 47-51, applicant again refers to the differences argued relative to the method claim.

Claims 52-58 have been added to recite additional features of particular embodiments of the invention. Claims 52-54 (method, computer program, and system) require that "all of the components to be performed by the computing device are performed non-preemptively using non-preemptible actions implemented as function calls without context switching." Claim 55 further requires that the method of claim 30 provide that "the determining an earliest action start time is a dynamic determination wherein the earliest action start time is computed dynamically at the end of execution of each action." Claim 56 further requires that the method of claim 30 provide that "each action is executed as a function call, and each action includes one or more instructions." Claim 57 further requires that the method of claim 30 provide that "there is no priority-based scheduling of actions, and no preemption of any executing actions, including no preemption of an executing action by an interrupt." Claim 58 further requires that the method of claim 30 further provide that "the method provides a scheduler that examines the actions which are implemented as function calls, and schedules them so that all of the ready actions are executed in the order they are required to be executed by the application."

Claims 60-63 further define the invention to include that each of the plurality of components consists of a plurality of actions, rather than include or comprise a plurality of actions.

Applicant submits that none of the cited art discloses, suggests, or motivates any need for the features in these newly added claims. This is not a limitation of the invention but is a feature of certain embodiments of the invention.

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CONCLUSION

In view of the foregoing, the applicant submits that the claims pending in the application comply with the requirements of 35 U.S.C. §112 and patentably define over the prior art. A Notice of Allowance is therefore respectfully requested.

If in the opinion of the Examiner, a telephone conference would expedite the prosecution of the subject application, the Examiner is encouraged to call the undersigned at (650) 838-4307.

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